

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

- Authorization for this examiner's amendment was given in a telephone interview with applicant's representative, Roger Lee, on 04/30/2008.

- In the Claims filed on 11/05/2007, please

AMEND the claims as in the following manner:

1. (Currently Amended) A method by which a plurality of client programs connected to a network deposit data items into a data repository connected to the network and avoid repeated storage of duplicated data items, the method comprising:

depositing a data item in the data repository for a depositing client program, the depositing including

determining a digital fingerprint from the data item using a hash function that produces digital fingerprints having a pseudorandom distribution;
comparing the determined digital fingerprint from the deposited data item to digital fingerprints of data items already stored in the data repository;

establishing from the comparing of digital fingerprints, without comparing the entire contents of the deposited data item to the entire contents of a data item already stored, whether a stored data item is identical to the deposited data item; and

~~ensuring that a stored data item identical to the deposited data item exists in the data repository, by storing the deposited data item in the data repository if comparing establishes that there is no match, and not storing the deposited data item in the data repository if comparing establishes that a match among the already stored data items is found~~ the deposited data item is not identical with any stored data item;

~~wherein associating the stored data item identical to the deposited data item is associated with a named object; the associating including associating the stored data item identical to the~~

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~~deposited data item with~~ and an access authorization credential which is uniquely associated with ~~the a~~ depositing client program or with a data repository user;

~~wherein associating~~ the access authorization credential is associated with the named object which comprises ~~the determined a digital~~ fingerprint; ~~and~~

~~wherein storing~~ the named object is stored in a database;

~~wherein retrieving~~ the stored data item ~~identical to the deposited data item~~, in response to a request by a retrieving client program, ~~the retrieving including~~ is retrieved by using the access authorization credential to select the stored named object;

retrieving the stored named object from the database; and

using the ~~determined digital~~ fingerprint from the retrieved named object to return the stored data item ~~identical to the deposited data item~~;

wherein the physical location or locations at which the stored data item ~~identical to the deposited data item~~ is stored in the data repository are determined at least in part by the ~~determined~~ digital fingerprint.

2-3. (Canceled)

4. (Previously Presented) The method of claim 154 wherein the encrypting of the deposited data item is performed by the depositing client program.

5-6. (Canceled)

7. (Currently Amended) The method of claim 154 wherein if the deposited data item is identical to each of a plurality of data items deposited independently by a plurality of the depositing client programs and if an encryption key is independently derived from the content of each of the plurality of data items, ~~and then~~ all of the independently derived encryption keys are the same.

8. (Currently Amended) The method of claim 154 wherein users ~~of the method~~ are grouped into a plurality of families, and the depositing client program acts on behalf of a user, and the key derived from the content of the deposited data item is determined in part by which of the plurality of families the user belongs to.

9. (Canceled)

10. (Currently Amended) The method of claim 1 ~~wherein further comprising associating the stored data item identical to the deposited data item is associated~~ with each of a plurality of access-authorization credentials, each of which is uniquely associated with a distinct data repository user or client program.

11. (Canceled)

12. (Previously Presented) The method of claim 1 wherein the stored named object is identified by information representative of the access-authorization credential.

13. (Canceled)

14. (Original) The method of claim 12 wherein the information representative of the access-authorization credential is a cryptographic hash of all or part of the access-authorization credential.

15. (Currently Amended) The method of claim 14 wherein the cryptographic hash is an access identifier that uniquely identifies the stored data item ~~identical to the deposited data item~~ for a particular user or client program.

16-19 (Canceled)

20. (Previously Presented) The method of claim 1 wherein the stored named object further comprises historical version information associating data items deposited at different times with different named object versions.

21-25. (Canceled)

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26. (Previously Presented) The method of claim 1 wherein named object history is preserved by creating a new version of the named object each time that a new data item is associated with it.

27. (Canceled)

28. (Previously Presented) The method of claim 26, wherein a determination of which versions of the named object to delete is based in whole or in part on the times at which the versions were created, and the intervals between these times.

29. (Currently Amended) The method of claim 1 ~~further comprising preparing~~ wherein a digital time stamp hash is prepared for each of a plurality of named objects to allow a property of these named objects to be proven at a later date.

30. (Previously Presented) The method of claim 29 wherein a random or other difficult to guess element is incorporated into the digital time stamp hash for each of the plurality of named objects, to prevent the property from being proven if this element is deleted.

31. (Currently Amended) The method of claim 1 ~~further comprising determining that~~ wherein it is determined that the stored data item ~~identical to the deposited data item~~ is no longer associated with any named object; and ~~reusing~~ the storage space used by the stored data item is reused.

32. (Canceled)

33. (Previously Presented) The method of claim 1 further comprising a challenge step to ascertain that the depositing client program has the entirety of the data item being deposited.

34-37. (Canceled)

38. (Currently Amended) The method of claim 1 wherein ~~there is a greater degree of user identification or a higher likelihood that~~ user identification will be ~~is~~ required when the depositing client program is acting on behalf of a depositor user and access to the data item

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being deposited for the depositor user can be shared with other users.

39. (Canceled)

40. (Currently Amended) The method of claim 1 wherein identity information about a depositor user associated with the depositing client program is made available to the retrieval client ~~programs~~ program, to discourage unlawful sharing of proprietary information.

41. (Currently Amended) The method of claim 40 wherein the identity information is stored in an encrypted form that ~~the depositor and~~ users with whom the depositor has shared access to the named object can both read and decrypt.

42. (Canceled)

43. (Currently Amended) The method of claim 1 wherein when the identity of a depositor user associated with the depositing client program has not been verified, ~~and~~ restrictions are placed on the use of the access authorization credential by retrieving programs associated with other users.

44. (Currently Amended) The method of claim 43 ~~further comprising limiting~~ wherein the rate of retrieving data associated with the named object is limited.

45-47. (Canceled)

48. (Previously Presented) The method of claim 1 wherein the deposit client program runs on a client machine and is a mirroring program which determines which data items to transmit to the data repository, and wherein that determination is based at least in part on the result of a comparison of digital fingerprints establishing that certain data items are not already stored in the data repository.

49-54. (Canceled)

55 (Previously Presented) The method of claim 1 wherein an index data item comprises fingerprints that identify a plurality of data items stored in the data repository, and the index data item is the data item that is deposited in the data repository and associated with the named object and the named object is used by the retrieving client program to retrieve one of the plurality of stored data items.

56-59. (Canceled)

60. (Currently Amended) The method of claim 15 wherein the data repository ~~comprises~~ is the database and the physical locations at which the named-object is stored are based on ~~the an~~ access identifier, ~~to introduce reproducible pseudorandomness into the physical location of the named object.~~

61-65. (Canceled)

66. (Previously Presented) The method of claim 1 wherein access to the named objects can be transferred between data repository users using the access authorization credential, without communicating with the data repository.

67. (Previously Presented) The method of claim 66 wherein at least one class of data repository users is not permitted to transfer access to their named objects to other users using access-authorization credentials individually associated with their named objects.

68-153. (Canceled)

154. (Previously Presented) The method of claim 1 wherein the depositing further comprises encrypting the deposited data item using a key derived from the content of the deposited data item.

155-174. (Canceled)

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175. (Currently Amended) The method of claim 1 ~~in which~~ wherein different physical locations comprise different hard disk drives.

176-177. (Canceled)

178. (Previously Presented) The method of claim 1 wherein the physical locations comprise data servers linked by a network.

179. (Currently Amended) The method of claim 1 wherein ~~determining~~ establishing from the comparing of digital fingerprints, without comparing the entire contents of the deposited data item to the entire contents of a data item already stored, whether a stored data item is identical to the deposited data item comprises transmitting over the network the digital fingerprint of the deposited data item rather than the deposited data item itself.

180-182. (Canceled)

183. (Previously Presented) The method of claim 1 wherein the depositing client program comprises a file server.

184. (Previously Presented) The method of claim 1 wherein the named objects represents a directory of a file system stored within the data repository.

185. (Previously Presented) The method of claim 1 wherein a structured item is split up into a plurality of data items with the divisions occurring at content dependent boundaries and the deposited data item is one of the plurality of data items.

186. (Canceled)

187. (Currently Amended) The method of claim 1 wherein the deposited data item is one of a plurality of identical data items deposited independently by a plurality of the depositing client programs, and a corresponding plurality of retrieving client programs all share read access to the stored data item ~~data item identical to the deposited data item~~.

188. (Currently Amended) The method of claim 187 wherein a retrieving client program which does not possess an access authorization credential ~~generated during deposit of the plurality of identical data items~~; cannot read the stored data item ~~identical to the deposited data item~~.

189. (Canceled)

190. (Currently Amended) The method of claim 1 wherein the data repository ~~comprises~~ is the database.

191. (Previously Presented) The method of claim 1 wherein the depositing client program and the retrieving client program are the same program.

192. (Previously Presented) The method of claim 1 wherein there exists a defined protocol used by data repository client programs to communicate with the data repository and the defined protocol allows data repository clients to deposit data items without sending their full contents if identical data items are already stored in the data repository, and the defined protocol only allows data repository clients to retrieve data items indirectly, by using access authorization credentials to select named objects.

REASONS FOR ALLOWANCE

- The following is an examiner's statement of reasons for allowance:

Prior arts of record do not render obvious, nor anticipate the combination of claimed elements including *the stored data item, in response to a request by a retrieving client program, is retrieved by using the access authorization credential to select the stored named object; retrieving the stored named object from the database; and using the digital fingerprint from the retrieved named object to return the stored data item; wherein the physical location or locations at which the stored data item is stored in the data repository are determined at least in part by the digital fingerprint as recited in claim 1.* Thus, claim 1 is allowed. Dependent claims 4, 7, 8, 10, 12, 14, 15, 20, 26, 28-31, 33, 38, 40, 41, 43, 44, 48, 55, 60, 66, 67, 154, 175, 178, 179, 183-185, 187, 188 and 190-192 are allowed at least by virtue of their dependencies from claim 20 and 35.

- Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

- Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG Q. PHAM whose telephone number is 571-272-4040. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TIM T. VO can be reached on 571-272-3642. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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**/HUNG Q. PHAM/
Primary Examiner
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May 6, 2008